

**Patent claims**

1. A graphical user interface for controlling a  
5 virtual reality (VR) graphics system by means of  
interactions with a function selection system that  
provides at least two functions, the VR graphics  
system having a projection device for visualizing  
10 a virtual three-dimensional scene and the  
interactions with the VR graphics system being  
effected using at least one interaction unit  
which, in interaction with a position detection  
sensor system for detecting a respective physical  
15 spatial position and/or orientation of the  
interaction unit, is used to provide position data  
in the VR graphics system, characterized by an  
interaction element which is functionally and  
visually formed from at least two subelements  
20 which respectively provide said function  
selection, the at least two subelements being  
designed such that they can be moved in a virtual  
three-dimensional manner relative to one another  
by means of a physical three-dimensional movement  
25 of the interaction unit, and said function being  
selected by means of the at least two subelements  
being moved in a virtual three-dimensional manner  
relative to one another.
2. The user interface as claimed in claim 1,  
30 characterized in that at least one of the  
subelements is at least occasionally displayed at  
an essentially fixed position in the virtual  
scene, said function being selected by means of a  
virtual three-dimensional movement of the  
35 respective other subelement relative to the  
subelement which is at least occasionally  
displayed at the fixed position.

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3. The user interface as claimed in claim 1 or 2, characterized in that the function selection is triggered, during the movement of the at least two subelements relative to one another, if the at  
5 least two subelements at least partially touch or overlap.
4. The user interface as claimed in one of claims 1 to 3, characterized in that the at least two-part  
10 interaction element is implemented in the form of a menu system, a function selection system or the like.
5. The user interface as claimed in claim 4,  
15 characterized in that the interaction element is formed by a spherical menu system which comprises three visual subelements and comprises an inner sphere which is formed in one part, a spherical shell which is formed from at least two spherical  
20 shell segments and is arranged on the visual surface of the inner sphere and a ring which is arranged in the outer region of the sphere or spherical shell and comprises at least two ring segments, the inner sphere providing to represent  
25 an item of state information relating to the instantaneous state of the spherical menu system.
6. The user interface as claimed in claim 5,  
30 characterized in that the state information indicates the menu level which is currently activated in the spherical shell segments in accordance with a menu tree.
7. The user interface as claimed in claim 5 or 6,  
35 characterized in that the spherical shell segments can be correspondingly rotated about the inner sphere, by means of user-guided rotation of the

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interaction unit, in order to make it possible to activate various spherical shell segments.

- 5 8. The user interface as claimed in one of the preceding claims, characterized in that provision is made of a latching function which depends on the angle of rotation of the interaction unit and/or of the respective subelement.
- 10 9. The user interface as claimed in one of the preceding claims, characterized in that an interaction which is to be effected on the basis of a physical rotational movement and/or physical translational movement of the interaction unit is  
15 triggered a corresponding interaction only when an empirically prescribable threshold value is exceeded.
- 20 10. The user interface as claimed in one of claims 3 to 9, characterized in that a further functional and/or visual relative displacement between the subelements is prevented as of a prescribable degree of overlap or touching between the at least two subelements.  
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11. The user interface as claimed in one of the preceding claims, characterized in that the relative displacement between the at least two subelements is effected in a guided manner.  
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12. The user interface as claimed in one of the preceding claims, characterized in that at least one of the subelements is visually displayed in animated form in the scene in the event of  
35 rotation and/or translation and/or touching.
13. The user interface as claimed in one of the preceding claims, characterized in that the

interaction unit has at least one control element which is used to at least assist said functional sequences of the user interface.

- 5 14. The user interface as claimed in one of the preceding claims, characterized in that said functional sequences of the user interface are assisted using voice input and/or the detection of gestures or facial expressions of the user.
- 10 15. The user interface as claimed in one of the preceding claims, characterized in that said touching or overlapping function comprises at least one logic operation.
- 15 16. A virtual reality (VR) graphics system having a graphical user interface as claimed in one of the preceding claims.